

### **REMARKS**

In the Non-Final Office Action mailed on October 10, 2003, the Examiner reviewed claims 1-18, 22, 23, 26 and 27. The Examiner rejected each of these claims based on *Dobson, et al.* (U.S. PG-Pub 2001/0034975 A1). Claims 1, 3, 16, 22, 23, 26 and 27 were rejected under 35 U.S.C. §102(e) as being anticipated by *Dobson, et al.* In addition, claims 2 and 4-15 were rejected as obvious under 35 U.S.C. §103(a) as being unpatentable over *Dobson, et al.* in view of *Ross* (U.S. 1,986,981). Finally, claims 17 and 18 were rejected as being unpatentable over *Dobson, et al.* in view of *Wierzchon* (U.S. 6,125,526). Applicant disagrees with the basis for the rejection of each of these claims and believes all of its currently pending claims to be in condition for allowance.

Specifically, *Dobson, et al.* is not prior art with respect to the pending application. As a preliminary matter, it should be noted that the publication date for *Dobson, et al.* is November 1, 2001. This date is after the foreign priority date of this application, which is February 7, 2001. The Examiner may seek to rely on the provisional application filing date of March 10, 2000 for this publication. However, the filed provisional application for *Dobson, et al.* does not show the embodiment of Figure 8. (See attached provisional patent application). The Examiner cannot rely on the filing date of the provisional patent application. Accordingly, *Dobson, et al.* is unavailable as a reference under 102(e) against the present application.

In addition, for the reasons stated above, *Dobson, et al.* is also unavailable as a reference under 35 U.S.C. §103(a). The assignee for *Dobson, et al.* is Meritor Light Vehicle Systems France, the same assignee of the present application. A copy of the

recently issued *Dobson, et al.* patent is herewith enclosed (U.S. Patent No. 6,634,142 B2). Under 35 U.S.C. §103(c), *Dobson, et al.* is not available as a prior art reference under 35 U.S.C. §103(a). For these reasons, the rejection of the currently pending claims is improper and claims 1-18, 22, 23, 26 and 27 are in condition for allowance.

Applicant believes that additional fees in the amount of \$110.00 is required for a one month extension. A check in the amount of \$110.00 is enclosed. The Commissioner is authorized to charge Deposit Account No. 50-1482 in the name of Carlson, Gaskey & Olds for any additional fees or credit the account for any overpayment.

Respectfully submitted,

CARLSON, GASKEY & OLDS

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Dated: February 10, 2004

**CERTIFICATE OF MAILING**

I hereby certify that the enclosed Response is being deposited with the United States Postal Service as First Class Mail, postage prepaid, in an envelope addressed to Commissioner For Patents, P. O. Box 1450, Alexandria, VA 22313-1450 on February 10, 2004.

  
Theresa M. Palmateer

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# **METHOD AND APPARATUS FOR MOUNTING A DRIVE MECHANISM WITHIN A DOOR MODULE**

## **BACKGROUND OF THE INVENTION**

This application relates to a method and apparatus for mounting a window drive mechanism within a vehicle door module.

Window drive mechanisms are used to move a vehicle door window between raised and lowered positions. The drive mechanisms can be either manually or electrically driven. In a manual drive interface, a handle is mounted to the vehicle door, which is connected to a cable and drum assembly that controls movement of the window. A vehicle occupant rotates the handle, which moves the window up or down depending on rotational direction. In a power drive interface, a motor mounted within the door is used to drive the cable and drum assembly. The vehicle occupant actuates a switch that controls the motor for moving the window up or down.

There is a limited amount of packaging space available within a door panel module for mounting of the drive mechanism and cable and drum assembly. Thus, the drive mechanism and cable and drum assembly components should be mounted together in a compact manner. Further, if there is a component failure within the window drive mechanism, the drive mechanism should be easily detached from the door panel module so that service operations can be performed.

Thus, it is desirable to have a mounting method and apparatus that provides a strong structural attachment for the drive mechanism and cable and drum components to the door panel module, and which is compact and easy to assemble and disassemble to perform service operations.

## **SUMMARY OF THE INVENTION**

An apparatus for mounting a window drive mechanism within a vehicle door module includes a door panel, a drive mechanism positioned on one side of the panel, and a drum assembly positioned on an opposite side of the panel from the motor. At least one fastener is used to mount the drive mechanism and the drum assembly to the panel. A retaining member is used to retain the drum assembly to the panel. The drive mechanism can be selectively detached from the panel by removing the fastener without detaching drum assembly from the panel.

In the preferred embodiment, the retaining member is an adhesive membrane having adhesive on a first side for adhering to the panel and adhesive on a second side opposite from the first side for adhering to the drum assembly. The adhesive can be initially mounted to either the panel or the drum assembly.

In an alternate embodiment, the drum assembly includes at least one male extension member for insertion through an opening in the panel. The drive mechanism includes a female member that receives the male member to properly locate the drive mechanism with respect to the door panel and drum assembly. The retaining member is comprised of a plurality of flexible fingers extending about a perimeter of the opening in the door panel. The flexible fingers grip the extension member when the drum assembly is mounted to the panel.

### **BRIEF DESCRIPTION OF THE DRAWINGS**

Figure 1 is schematic view of a vehicle incorporating the subject window drive mechanism mounted within a door panel module.

Figure 2 is a side view of one embodiment for mounting a power drive mechanism within a door panel module.

Figure 3 is a side view of an alternate embodiment for mounting a power drive mechanism within a door panel module.

Figure 4 is a side view of an alternate embodiment for mounting a power drive mechanism within a door panel module.

Figure 5 is a side view of an alternate embodiment for mounting a power drive mechanism within a door panel module.

Figure 6 is a side view of one embodiment for mounting a manual drive mechanism within a door panel module.

Figure 7 is a side view of an alternate embodiment for mounting a manual drive mechanism within a door panel module.

### **DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT**

As shown in Figure 1, a vehicle 10 includes a plurality of windows 12 that can be moved between raised and lowered positions. Window drive assemblies or window regulators, shown generally at 14, are mounted within each door panel module 16 for controlling movement of the windows. The drive assemblies 14 can be either manually or electrically driven.

An example of a power drive interfaces is shown in Figure 2. The mounting apparatus for attaching a drive assembly 14 within the vehicle door module 16 includes a door panel member 18 that is mounted within the door module 16. An electric motor drive mechanism 20 is positioned on one side 22 of the panel 18 and a drum assembly 24 is positioned on an opposite side 26 of the panel 18 from the motor 20. Preferably, the drum assembly 24 is positioned on the "wet" side 26 of the door panel 18 and the motor 20 is positioned on the "dry" side 22 of the panel 18, however, the position of the components could also be reversed.

The drum assembly 24 is comprised of a drum 28 about which a flexible cable member 30 is wound. The drum 28 is mounted to a drum-box 32 that is attached to a vehicle door or frame member 34. The motor 20 includes a drive shaft 36 that drives the drum 28 to wind or unwind cable 30 from the drum 28 causing the window 12 to be raised or lowered depending on direction of rotation.

At least one fastener 38 is used to mounting the motor 20 and the drum assembly 24 to the panel 18. Preferably at least two (2) or three (3) fasteners 38 are used for attachment purposes, however, only one (1) is shown.

An adhesive membrane 40 is used to retain the drum assembly 24 to the panel 18. The use of the adhesive membrane 40 allows the motor 20 to be selectively detached from the panel 18 by removing the fastener 38 but prevents the drum assembly 24 from detaching from the panel 18. The adhesive membrane 40 has adhesive on a first side 42 for adhering to the panel 18 and adhesive on a second side 44 opposite from the first side 42 for adhering to the drum assembly 24. Any type of adhesive

known in the art can be used, however, the adhesive should be strong enough to securely hold the drum assembly 24 to the panel 18 without the assistance of the fastener 38.

The drum assembly 24 includes at least one male member 46 and the motor 20 includes at least one female member 48. The male 46 and female 48 members are used to properly locate the motor 20 with respect to the panel 18 and the drum assembly 24.

The male 46 and female 48 members are mated together during assembly of the motor 20 and drum assembly 24 to the panel 18. It should be understood that position the male 46 and female 48 members could be reversed.

The male member 46 extends through an opening 50 in the panel 18 when the drum assembly 24 is adhered to the panel 18. The female member 48 slides over the male member 46 when the motor 20 is fastened to the panel 18.

In one embodiment, the male member 46 includes a central bore 52 for receiving the fastener 38. The fastener is inserted through the motor 20 into the female member 48 and then into the male member 46.

Preferably, the male member 46 is cylindrical in shape, as shown in Figure 2. In this embodiment, the male member is coaxial with the central bore 52 for receiving the fastener 38. It should be understood that the male member 46 could also be located separately from the fastening areas on the drum assembly 24.

In another embodiment shown in Figure 3, the male member 46 is conical in shape and has a tip 54 that is smaller in diameter than the base 56.



As shown in Figure 4, the adhesive membrane 40 can either be attached first to the panel 18 as indicated at "A" or can be attached first to the drum assembly 24 as indicated at "B". Preferably, the adhesive membrane 30 is adhered to the drum-box 32 such that the drum 38 can engage the motor drive shaft 36 and rotate freely.

In an alternate embodiment, shown in Figure 5, the drum assembly 24 is retained to the panel 18 by a plurality of "sprags" or flexible fingers 58. The fingers 58 are spaced about the opening 50 in the panel 18. The fingers grip the male member 46 when the male member is inserted through the opening. In this embodiment, the male member 46 includes a head portion 60 that is greater in width than a base or neck portion 62. As the male member 46 is inserted through the opening, the fingers 58 flex over the head portion 60 and grip about the neck portion 62. Although only one opening 50 is shown, the panel 18 can include several openings 50 with fingers 48 and the drum assembly 24 can include several male members 46.

In a manual drive interface shown in Figure 6, a handle portion 64 is mounted to the vehicle door panel 18. The handle 64 drives the drum assembly 24 to control movement of the window 12. A vehicle occupant rotates the handle 64, which moves the window 12 up or down depending on rotational direction.

The drum assembly includes a male member 66 and the handle 64 includes a female portion 68 that are configured similarly to the power drive interfaces discussed above. In one embodiment, the male members 66 are cylindrical in shape (Fig. 6) and in an alternate embodiment, the male members 66 are conical in shape (Fig. 7).



An adhesive membrane 40 (Fig. 6) can be used to retain the drum assembly 24 to the panel 18 or a plurality of flexible fingers 58 (Fig. 7) can be used to retain the drum assembly 24 to the panel 18. The adhesive membrane 40 and the flexible fingers 58 operate in a similar manner as discussed above with regard to the power drive mechanism. At least one fastener 38 is used to attach the handle 64 to the panel 18 and drum assembly 24. The handle 64 can be removed from the panel 64 selectively and independently from the drum assembly 24 for service operations.

The subject mounting method an apparatus provides a simple and compact mount for attaching a window drive mechanism within a door module. The motor 20 or handle 64 can be removed from the door panel 18 without having to remove the drum assembly 24. This facilitates serviceability of the drive mechanism.

Preferred embodiments of this invention have been disclosed, however, a worker of ordinary skill in the art would recognize that certain modifications would come within the scope of this invention. For that reason the following claims should be studied to determine the true scope and content of this invention.

**CLAIMS**

We claim:

1. An apparatus for mounting a drive mechanism within a vehicle door to move a window comprising:
  - a door panel;
  - a drive mechanism positioned on one side of said panel;
  - a drum assembly positioned on an opposite side of said panel from said motor;
  - at least one fastener for mounting said drive mechanism and said drum assembly to said panel; and
  - a retaining member for retaining said drum assembly to said panel wherein said drive mechanism can be selectively detached from said panel by removing said fastener without detaching drum assembly from said panel.
2. An apparatus according to claim 1 wherein said drum assembly includes at least one first locating portion and said drive mechanism includes at least one second locating portion, said first and second locating portions being mated together during assembly of said drive mechanism and drum assembly to said panel.

3. An apparatus according to claim 2 wherein said first locating member is a male member extending through said panel when said drum assembly is adhered to said panel and said second locating member is a female member that receives said male member when said drive mechanism is fastened to said panel.
4. An apparatus according to claim 3 wherein said male member includes a central bore for receiving said fastener.
5. An apparatus according to claim 3 wherein said male member has a cylindrical shape.
6. An apparatus according to claim 5 wherein said cylindrical male member is coaxial with said central bore
7. An apparatus according to claim 3 wherein said male member has a conical shape.
8. An apparatus according to claim 1 wherein said retaining member is an adhesive membrane having adhesive on a first side for adhering to said panel and adhesive on a second side opposite from said first side for adhering to said drum assembly.

9. An apparatus according to claim 8 wherein said drum assembly includes at least one male locating member and said drive mechanism includes at least one female locating member for receiving said male locating member when said drive mechanism and said drum assembly are assembled to said panel, said membrane including at least one opening such that said male locating member extends through said membrane to engage said female locating member.

10. An apparatus according to claim 1 wherein said drum assembly includes at least one male extension member for insertion through an opening in said panel and wherein said retaining member is comprised of a plurality of flexible fingers extending about a perimeter of said opening, said flexible fingers for gripping said extension member when said drum assembly is mounted to said panel.

11. An apparatus according to claim 10 wherein said male extension member includes a head portion having a first width and a neck portion having a second width less than said first width, said flexible fingers flexing over said head portion to grip said neck portion when said drum assembly is mounted to said panel.

12. A method of assembling a drive mechanism to a door panel comprising the steps of:

- (a) retaining a drum assembly to one side of the door panel;
- (b) locating a drive mechanism on an opposite side of the panel with respect to the drum assembly;
- (c) fastening the drive mechanism to the panel and drum assembly with at least one fastener such that the drive mechanism is selectively removable from the panel without detaching the drum assembly from the panel.

13. The method according to claim 12 wherein step (a) includes mounting an adhesive member between the panel and drum assembly to retain the drum assembly to the panel independently from the fastener.

14. The method according to claim 12 wherein step (a) includes providing a male extension member on the drum assembly, inserting the extension member into the panel, and gripping the extension member with a plurality of flexible fingers to retain the drum assembly to the panel independently from the fastener.

15. The method according to claim 12 including the step of unfastening the fastener and detaching the drive mechanism from the panel while leaving the drum assembly attached to the panel for service operations.

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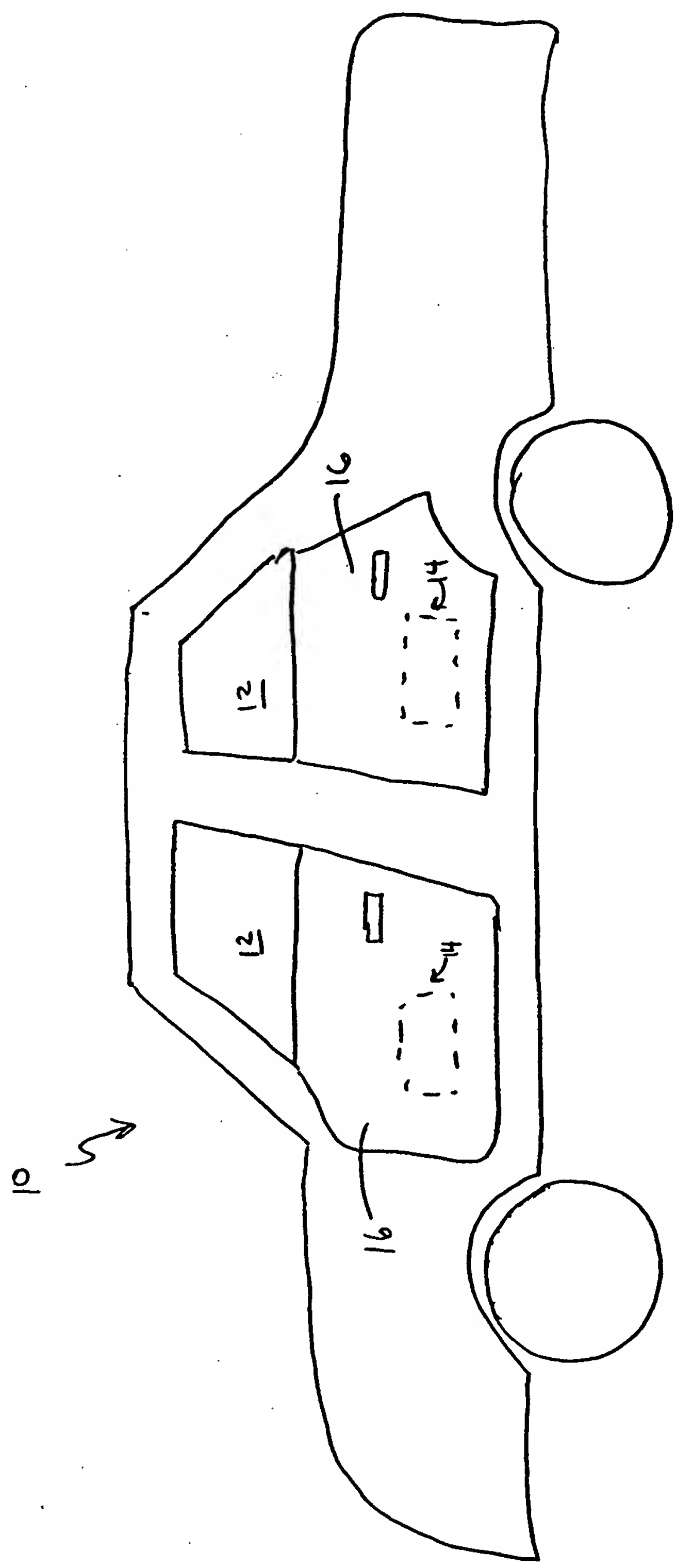


Fig. 1

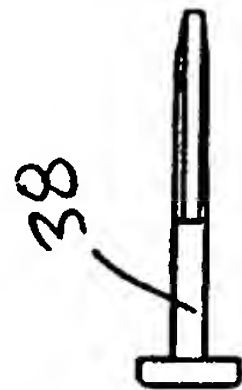
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# Meritor Door Systems

## Meritor : Concept Sketch

Power Drive Interface

MATCHING FEMALE FORM IN  
 MOTOR 40



TYPICALLY  
 2 OR 3  
 FIXINGS

### SOLUTION ①

- ADVANTAGE**
- ADDS SEALING FUNCTION
- DISADVANTAGE**
- COST OF MEMBRANE

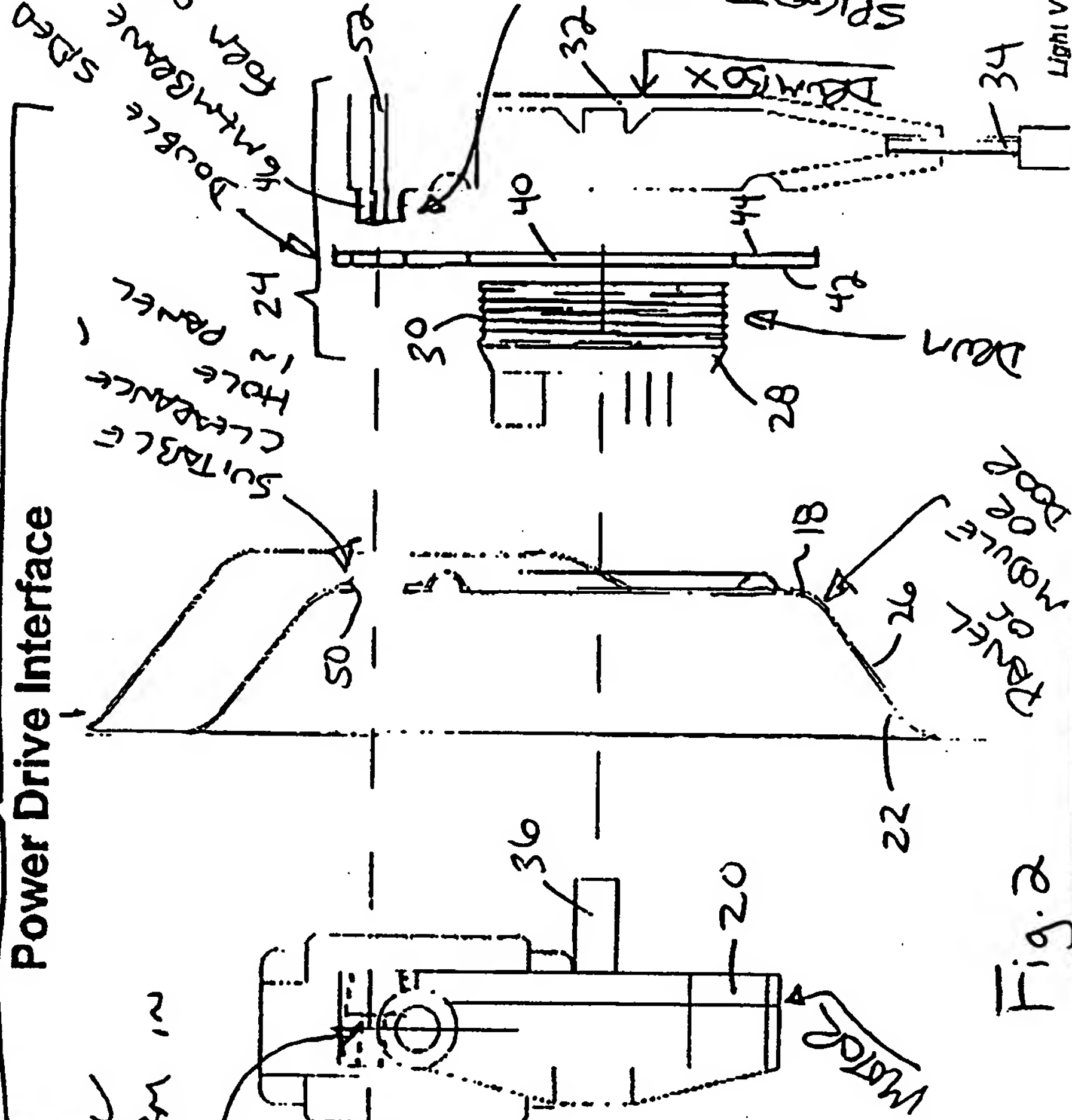


Fig. 2

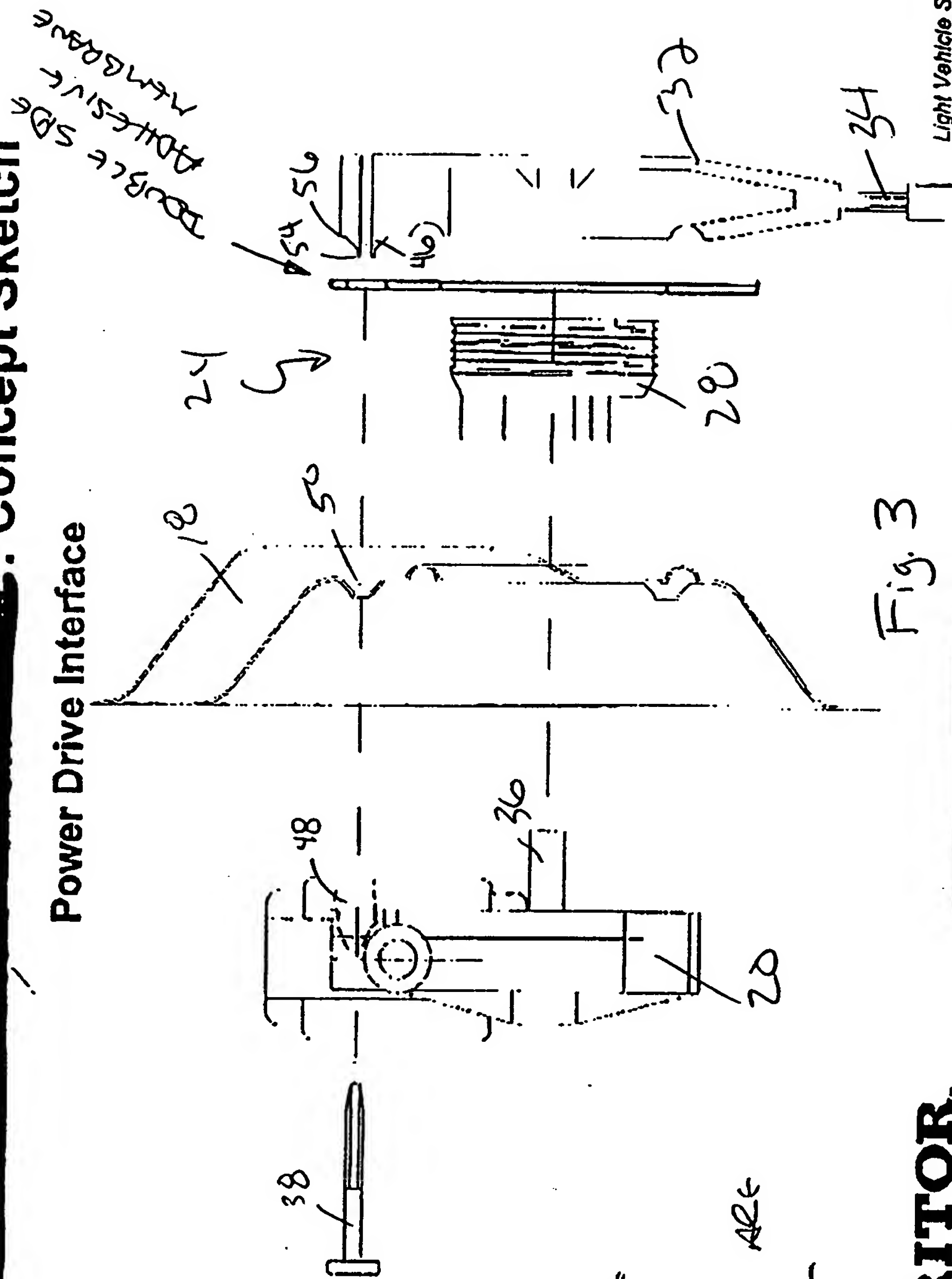
Light Vehicle Systems





# Concept Sketch

# Power Drive Interface



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Lij

## Light Vehicle Systems

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Solution 2  
= Solution 1  
But spikes are  
conical



**MERITOR.**  
A Heritage of Rockwell Technology

## A History of Postwar Theater

8MFDS002-750200-11

8MFDS002-750200-11

8MFDS002-750200-11

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# Meritor Door Systems

## Power Drive Interface: Concept Sketch

Power Drive Interface

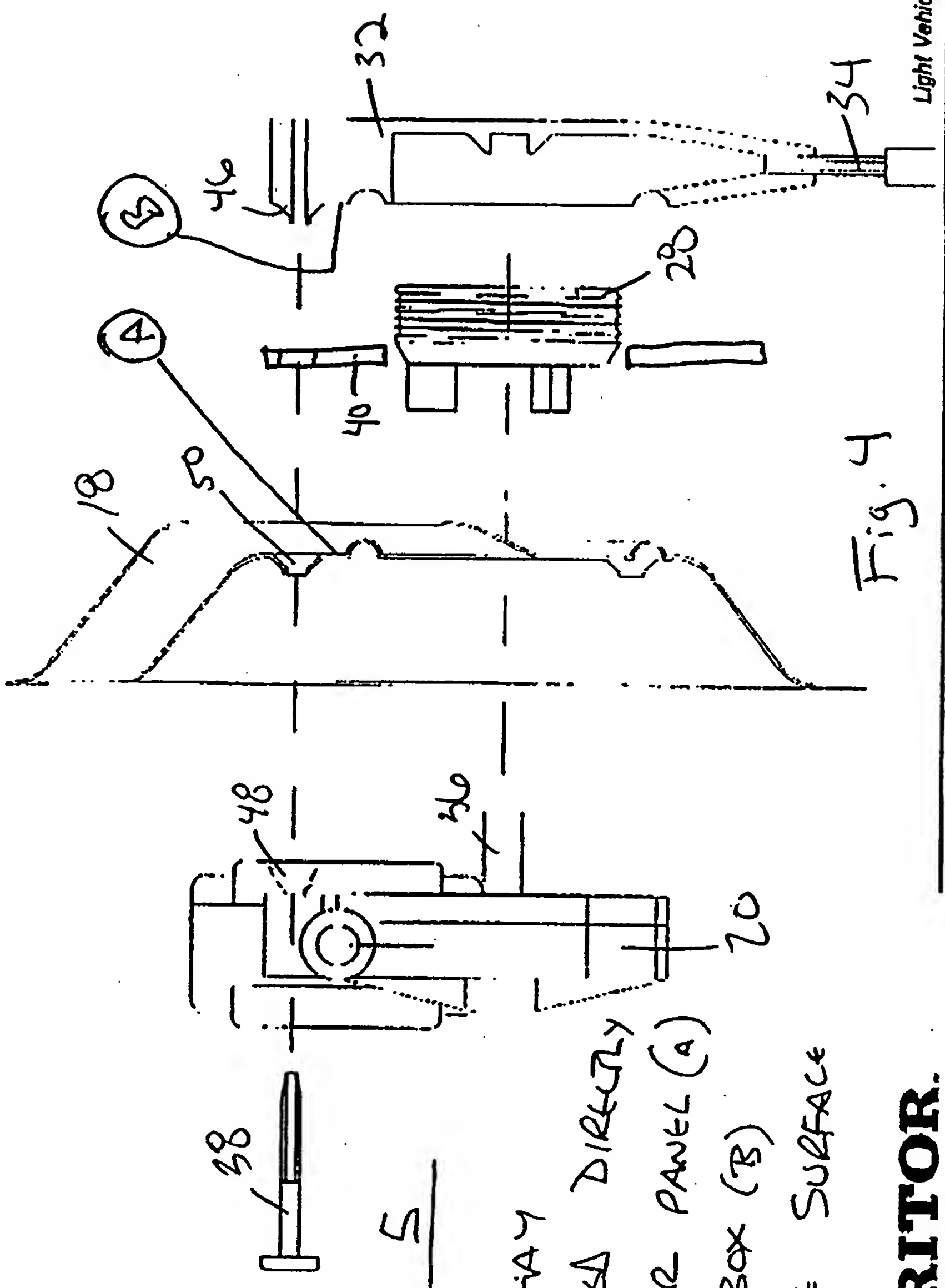


Fig. 4

SOLUTION 5  
CONTACT  
ADHESIVE MAY  
BE DEPOSITED DIRECTLY  
ONTO EITHER PANEL (A)  
OR DRUMBOX (B)  
INTERFACE SURFACE



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(2)

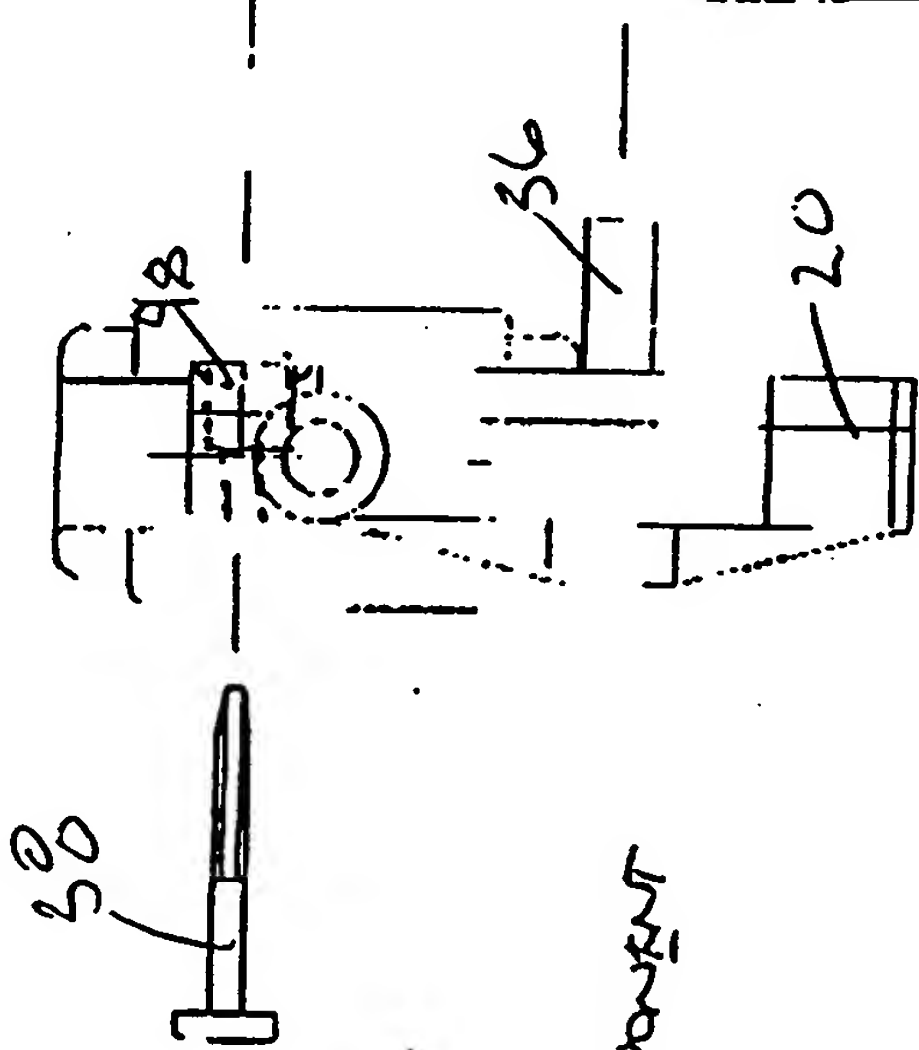


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# Meritor Door Systems

## Power Drive Interface : Concept Sketch

Power Drive Interface



Solution 3

ADVANTAGE

NO EXTRA COMPONENT

DISADVANTAGE

DIFFICULTY IN MAINTAINING SPRAG FORM DETAIL

IN SERIES PRODUCTION OF LARGE

MODULE PANEL

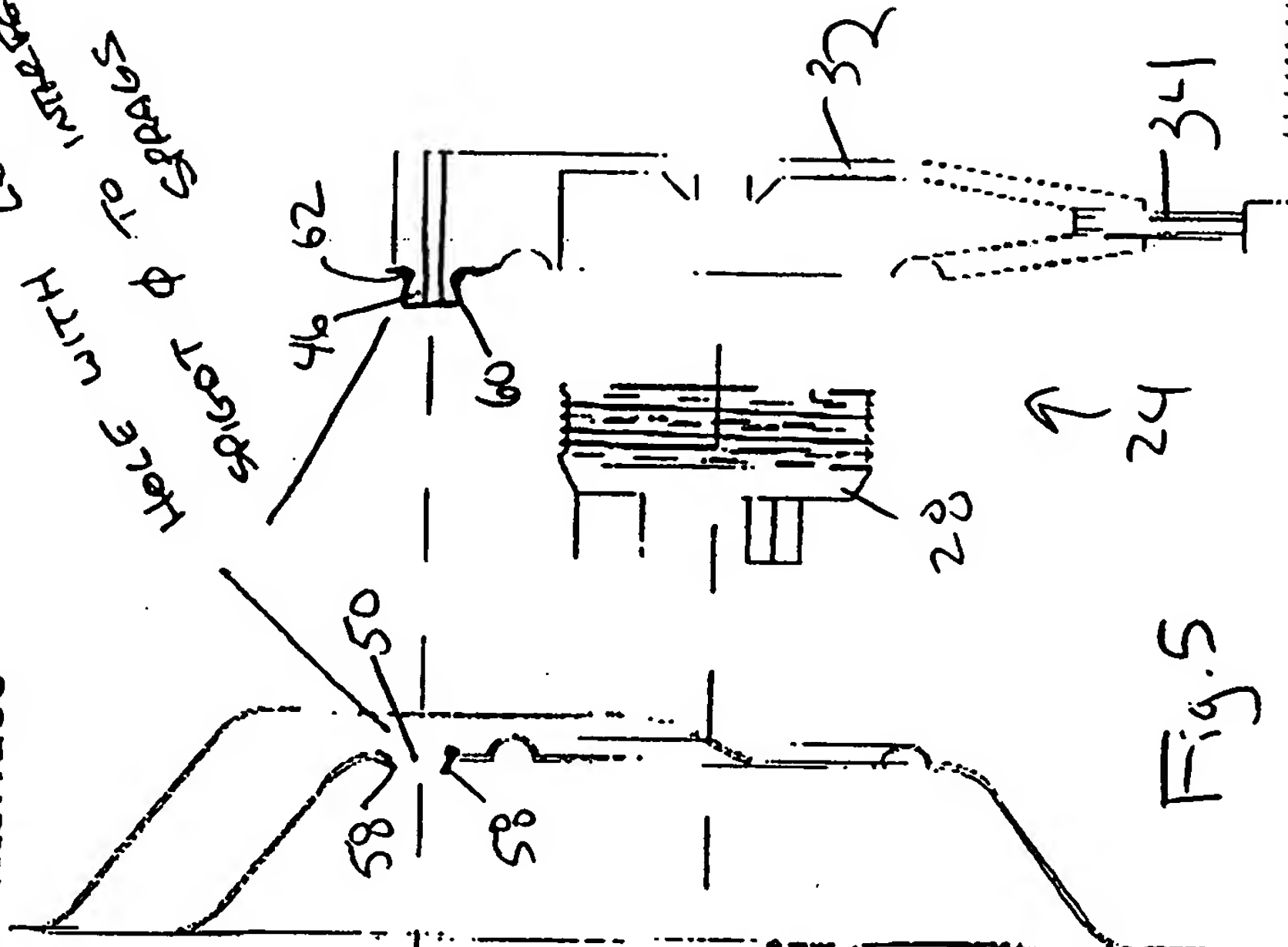


Fig. 5

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# Meritor Door Systems ~~Light Vehicle Systems~~ : Concept Sketch

Manual Drive Interface

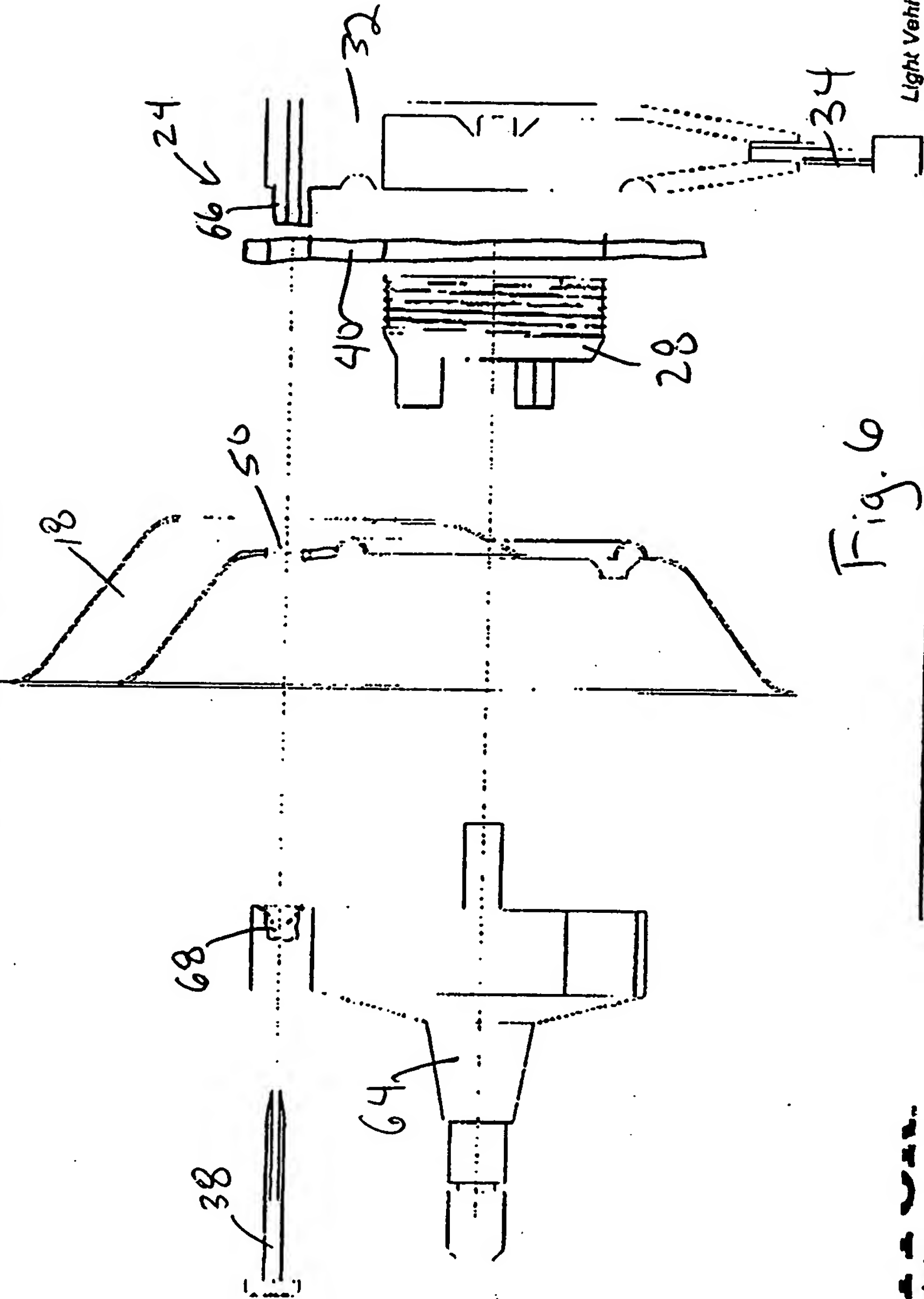


Fig. 6

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MANUAL DRIVE INTERFACE  
CAN BE IDENTICAL TO  
ELECTRIC VERSION  
ANY SOLUTION





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# Meritor Door Systems

## Door 1 & Door 3 - Front Door : Concept Sketch

Manual Drive Interface

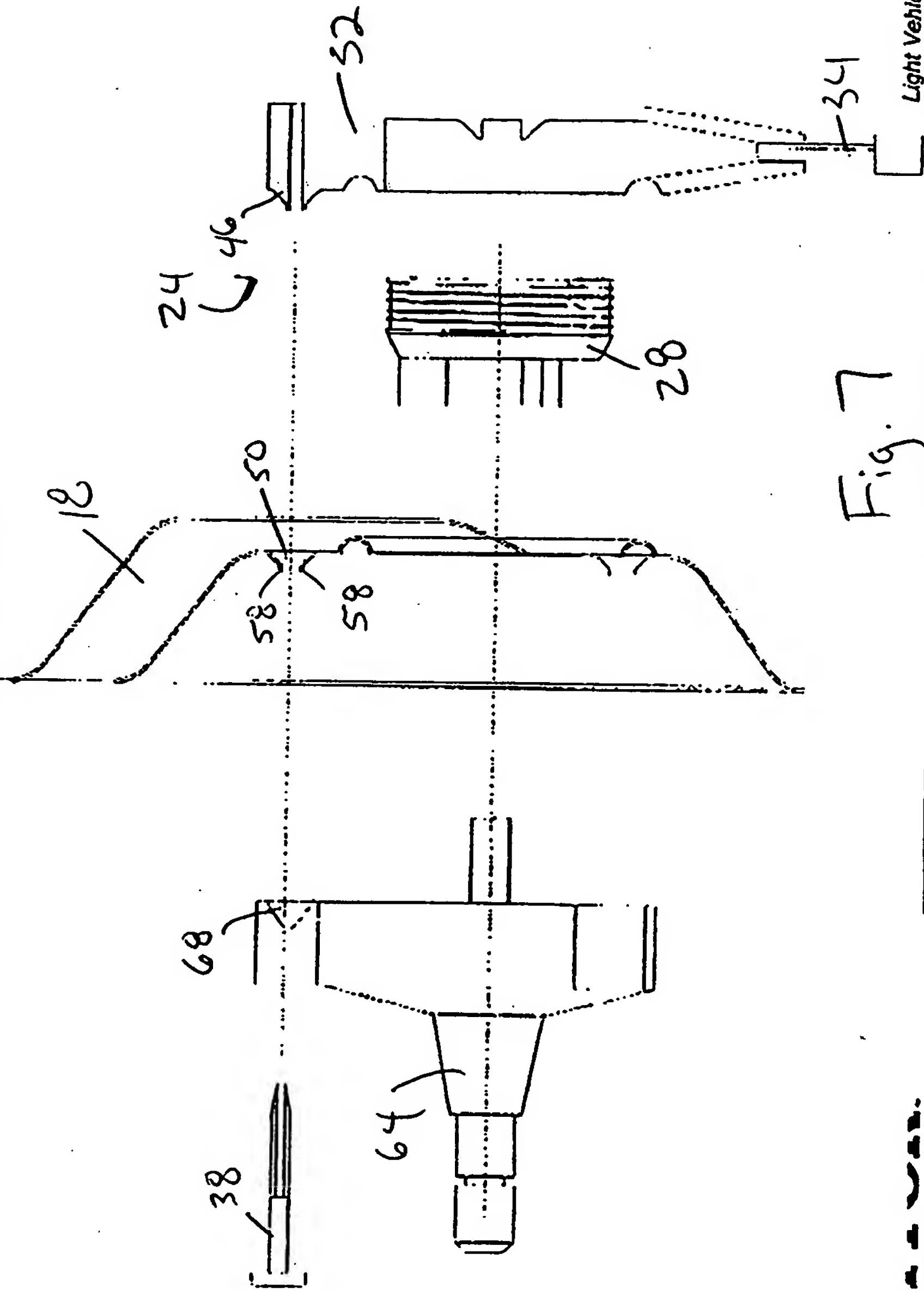


Fig. 7

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